

# Bio-Indicator Instrument for NASA Planetary Missions

Completed Technology Project (2014 - 2016)



## Project Introduction

We propose to develop an analytical new real-time technique of remote detection and discrimination of any bio-signatures dispersed in the ground-level planetary atmosphere, with or without the presence of solar optical background radiation but further technological development is required to modify the instrument for planetary environments. The work proposed here accomplishes the first step towards the development of a NASA Bio-Indicator Instrument using a low cost simulation approach. Capabilities of the first atmospheric bio-indicator survey instrument will dramatically increase the probability of finding the signatures of extraterrestrial life.

This concept maturation project will lead to the validation of the instrument model of Bio-Indicator technology as the first step towards development of a novel Astrobiology instrument.

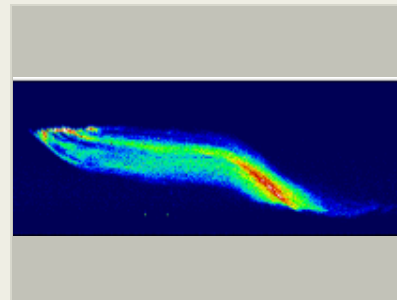
In line with the NASA mission and vision statement and the innovative element of the proposed work is to significantly increase the probability of finding the bio-signatures of extraterrestrial life and to guide future NASA missions towards the discovery of life.

Development of the Bio-Indicator Instrument shall be done at Goddard Space Flight Center.

## Anticipated Benefits

All astrobiology related missions.

The types of mission opportunities to which this instrument could ultimately be proposed following appropriate maturation include all lander missions.



Bio-Indicator

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## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Goddard Space Flight Center (GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland

Co-Funding Partners	Type	Location
Army Chemical and Biological Center	US Government	Aberdeen, Maryland
Science and Engineering Services, Inc	Industry Small Disadvantaged Business (SDB)	Burtonsville, Maryland

## Primary U.S. Work Locations

Maryland

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Goddard Space Flight Center (GSFC)

**Responsible Program:**

Center Innovation Fund: GSFC CIF

## Project Management

**Program Director:**

Michael R Lapointe

**Program Manager:**

Peter M Hughes

**Project Managers:**Brook Lakew  
Terence A Doiron**Principal Investigator:**

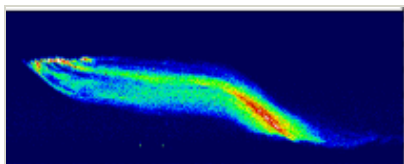
Branimir Blagojevic

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## Images



### Bio-Indicator

Bio-Indicator

(<https://techport.nasa.gov/image/16264>)

## Links

GSC-17469-1

(<https://ntts.arc.nasa.gov/app/>)

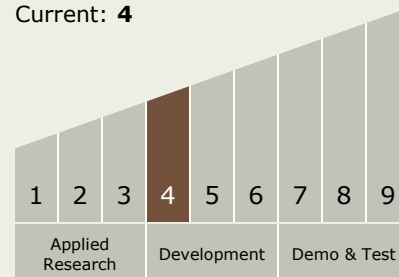
### Project Website:

<http://sciences.gsfc.nasa.gov/sed/>

## Technology Maturity (TRL)

Start: 4

Current: 4



## Technology Areas

### Primary:

- TX04 Robotic Systems
  - TX04.3 Manipulation
    - TX04.3.4 Sample Acquisition and Handling